MONTHLY WEATHER REVIEW.

VOL. XII. WASHINGTON CITY, JANUARY, 1884. No. 1

INTRODUCTION.

The general meteorological conditions which prevailed over the United States during January, 1884, as compiled from the reports from the regular and voluntary observers of the Signal Service, and from the monthly reports of state weather services, are shown in this REVIEW. Descriptions of the storms which occurred over the north Atlantic ocean are also given under "north Atlantic storms," and their approximate paths shown on chart ii. On this chart is also shown the limit within which icebergs were observed during January, and up to February 14th.

Remarkably low minimum temperatures occurred over the northern slope on the 4th, and in the Missouri, Mississippi and Ohio valleys, south Atlantic and east Gulf states during the 5th, 6th and 7th. These low temperatures were associated with high area number iii. described under "areas of high barometer." The minimum temperatures over the region from the upper lakes to New England, on the 24th, 25th and 26th, in connection with high area number vii., were also unusually low.

The mean temperature of the month averaged from 2°.3 to 8°.2 below the normal over the districts east of the one hundreth meridian, the region of greatest departure below the normal extending from the lakes to the Gulf of Mexico between the eightieth and ninetieth meridians.

The monthly precipitation was decidedly excessive in the districts on the Atlantic coast, while in the Pacific coast regions large deficiencies occurred.

Eighteen atmospheric depressions are described under "areas of low barometer." The paths of the centres of fourteen of these are shown on chart i.

In the preparation of this REVIEW the following data, received up to February 20th, 1884, have been used, viz.: the regular tri-daily weather-charts, containing data of simultaneous observations taken at one hundred and twenty-two Signal Service stations and fourteen Canadian stations, as telegraphed to this office; one hundred and sixty-four monthly journals, and one hundred and fifty-one monthly means from the former, and fourteen monthly means from the latter; two hundred and seventy-one monthly registers from voluntary observers; forty-eight monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports, through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs, furnished by the publishers of "The New York Maritime Register;" monthly weather reports from the local weather services of Indiana, Iowa, Kansas, Nebraska, Ohio, and Tennessee, and of the Central Pacific railway company; trustworthy newspaper extracts; and special reports.

ATMOSPHERIC PRESSURE.

[Expressed in inches and hundredths.]

The distribution of mean atmospheric pressure for January, 1884, determined from the tri-daily telegraphic observations of the Signal Service, is shown by the isobarometric lines on chart iii. This chart shows that the region of greatest pressure covers parts of Colorado, Utah, Idaho, and Wyoming, where the barometric means exceeded 30.3, and a small area in central Texas, where a maximum mean pressure of 30.3 occurred. The region between the isobars of 30.25 embraces the greater part of the United States. The more easterly isobar of 30.25, is traced from northeastern Dakota in a southeasterly direction to northern Florida, and thence westward along the immediate Gulf coast to the boundary of Mexico. The more westerly isobar of 30.25 extends from the northern boundary of Washington Territory, first in a southerly direction to central Nevada, and thence southeastward to southern New Mexico. Over a small area (inclosed by the isobar of 30.25), including eastern Colorado and parts of adjacent states, the mean pressure was slightly below 30.25. The highest barometric mean for the month, 30.35, is reported from Salt Lake City, Utah.

The mean pressure for the month was least over the region from northern Michigan to the Canadian maritime provinces, and on the immediate coast of the Pacific north of Cape Mendocino, California. The lowest barometric means reported are 30.0 at Father Point, Quebec, and 30.03 at Sidney, Nova Scotia.

Compared with the mean pressure of December, 1883, there has been an increase over the whole country, except in Oregon and northern California, where a decrease ranging from .02 to .05 occurred. The increase has been greatest over the region from Illinois and Missouri southward to the Gulf of Mexico, where it varies from .10 to .13. An excess of from .07 to .11 also occurred in Nova Scotia. The changes elsewhere were less marked.

DEPARTURES FROM THE NORMAL VALUES FOR THE MONTH.

Compared with the normal pressure, deficiencies of from .01 to .02 are shown in northern California and southern Oregon; in the eastern part of the lake region, in New England and the middle Atlantic states the mean pressure has also been below the normal, the departures varying from .01 to .07. In all other districts the mean pressure has been above the normal. The departures of excess were greatest in the Rio Grande valley, where they varied from .14 to .20; in the middle and southern slopes, Missouri valley and western Gulf states they varied from .07 to .13.

BAROMETRIC RANGES.

The monthly barometric ranges were greatest in the middle Atlantic states and New England, and smallest in Arizona. They varied in the extremes from .47 at Forts Apache and Grant, Arizona, to 1.83 at Albany, New York.

In the several districts the monthly barometric ranges varied as follows:

New England.—From 1.28 on the summit of Mount Washington, New Hampshire, to 1.77 at Eastport, Maine.

Middle Atlantic states.—From 1.49 at Lynchburg and Norfolk, Virginia, to 1.83 at Albany, New York.

South Atlantic states.—From .86 at Jacksonville, Florida, to 1.42 at Kitty Hawk, North Carolina.

Florida peninsula.—From .52 at Key West, to .80 at Cedar Keys.

Eastern Gulf states.—From .86 at Pensacola, Florida, Mobile, Alabama, and Vicksburg, Mississippi, to .96 at New Orleans, Louisiana.

Western Gulf states.—From .84 at Palestine, Texas, to 1.03 at Fort Smith, Arkansas.

Rio Grande valley.—From .95 at Rio Grande City, Texas, to .96 at Brownsville, Texas.

Tennessee.—From .84 at Chattanooga, to 1.01 at Memphis.

Ohio valley.—From 1.05 at Louisville, Kentucky, to 1.28 at Pittsburg, Pennsylvania.

Lower lake region.—From 1.22 at Toledo, Ohio, to 1.73 at Oswego, New York.

Upper lake region.—From 1.17 at Chicago, Illinois, to 1.46 at Alpena, Michigan.

Extreme northwest.—From 1.28 at Fort Buford, Dakota, to 1.49 at Saint Vincent, Minnesota.

Upper Mississippi valley.—From 1.00 at Springfield, Illinois, to 1.26 at Saint Paul, Minnesota.

Missouri valley.—From 1.16 at Leavenworth, Kansas, to 1.34 at Yankton, Dakota.

Northern slope.—From .70 at Cheyenne, Wyoming, to .99 at North Platte, Nebraska.

Middle slope.—From .62 on the summit of Pike's Peak, Colorado, to 1.02 at Dodge City, Kansas.

Southern slope.—From .57 at Fort Davis, Texas, to .94 at Fort Concho, Texas.

Southern plateau.—From .47 at Forts Apache and Grant, Arizona, to .72 at El Paso, Texas.

Middle plateau.—1.00 at Salt Lake City, Utah.

Northern plateau.—From 1.07 at Spokane Falls, Washington Territory, to 1.18 at Lewiston, Idaho.

North Pacific coast.—From 1.11 at Fort Canby, Washington Territory, to 1.17 at Roseburg, Oregon.

Middle Pacific coast.—From .90 at Sacramento, California, to 1.15 at Cape Mendocino, California.

South Pacific coast.—From .58 at San Diego, California, to .83 at Yuma, Arizona.

AREAS OF HIGH PRESSURE.

Below are described nine areas of high-pressure. Numbers i., iii., iv., vi., and vii. were well-defined and extensive, especially iii., iv., and vii. In the plateau regions the lowest temperatures of the month generally occurred on the 1st and 2d during the presence of area number i. During the movement of number iii. the lowest temperatures were produced on the 4th in the northern slope and extreme northwest; 5th, southern slope, western Gulf states, Missouri valley and upper Mississippi valley; 5th and 6th, eastern Gulf states, south Atlantic states, Tennessee, Ohio valley, western part of lower lake region, and southern part of upper lake region; 6th and 7th, middle Atlantic states and New England coast. In central and southern Florida the lowest temperatures were reported on the 21st and 22d, during the movement of area number vi. From the northern part of the upper lake region southeastward over the northern parts of Pennsylvania, New York and New England, and in the middle slope region the lowest temperatures accompanied area number vii. on the 24th to the 26th.

I and II.—These high-pressure areas are continuations of number ix. described in the December, 1883, REVIEW. On the morning of the 1st number i. covered western Montana, Idaho and Utah, with a barometric ridge extending over western Texas; barometer at Salt Lake City, 30.83, or .59 above the normal; freezing temperature was general to Texas, with a severe "norther" on the coast, which extended across the Gulf. During the day it separated into two distinct areas, one over Nevada and the surrounding country, which lost its identity on the 4th, and the other over Texas; 1st, midnight barometer at Rio Grande City, 30.77, or .63 above the normal. By morning of the 2d freezing weather extended eastward to western Florida, and on the morning of the 3d over the northern half of Florida, with the temperature from 20° to 30° below the normal. During the 4th it was apparently dissipated over northern Florida. Number ii. was central north of Dakota on the morning of the 1st, with a barometric ridge and temperature more than 20° below the normal extending to Kansas; barometer at Minnedosa, Manitoba, 30.90, or more than .60 above the normal. During the day it was gradually dissipated.

III.—During the 2d and 3d this high area advanced southward over the Northwest Territory, and extended its influence southeastward over the Missouri valley. On the 4th, highest barometer at Qu'Appelle 30.99, and at Fort Buford 30.93, or .76 above normal; minimum temperature at Qu'Appelle —48°, at Minnedosa, Fort Garry, and Moorhead —43°, and from 30° to 40° below the normal from Montana, Dakota, and Minnesota southeastward to the Ohio valley, Arkansas, and northwestern Texas. At night a "norther" occurred on the Texas coast, which on the 5th was felt along the entire Gulf coast. During the 5th and 6th it appeared as an extensive barometric ridge reaching from Manitoba southeastward to the Gulf states, but with slowly diminishing pressure; the temperature fell about 50° below the normal in the lower Ohio valley and Tennessee. On the 7th, in advance of low area number iv., it moved eastward over the middle Atlantic states and the 8th over New England.

IV.—On the 6th this high area appeared in California, but with the pressure only slightly above the normal. The 7th, it passed eastward to the central and southern plateau regions, and on the 8th and 9th it again withdrew northwestward to the north Pacific coast. By morning of the 10th it was central in Washington Territory; barometer at Olympia, 30.52, or .45 above the normal. During the 10th it moved southeastward and covered the country from the Pacific coast to the upper Mississippi valley and western Texas. Between it and low areas numbers vi. and vii. the gradient became steep, and high northerly winds and gales resulted from the Missouri valley to the Texas coast. On the 11th and 12th it continued nearly stationary as an extensive barometric ridge reaching from Oregon southeast to the Gulf states. The movement of low area number ix. southeast over Manitoba caused this high area to divide into two distinct areas; one passed eastward over the Gulf states during the 12th and 13th to the south Atlantic coast, where it was dissipated; the other apparently moved northwestward to Oregon and Washington Territory, and thence extended east to Manitoba and Dakota. The 14th it covered the country from Washington Territory and Oregon to the upper lake region, but with a tendency to move eastward. On the morning of the 15th the highest was central over Manitoba; in Wyoming, and from Manitoba southeast over the northern portion of the lake region to the Saint Lawrence valley, the temperature fell 20° or more below the normal—at Ottawa, Canada, 40° below. During the day it moved southward; morning of the 16th, it was central in Missouri, with fair weather throughout the United States, excepting in Texas. The 16th and 17th, it slowly moved to the South Atlantic coast, where it disappeared on the 18th.

V.—During the 15th and 16th, while number iv. was moving southeastward, this high area gradually formed over the plateau districts; it moved westward toward the Pacific coast on the 17th, northward over Washington Territory on the 18th, southward over the plateau regions on the 19th and 20th, northwest to Washington Territory the 21st, continued nearly stationary the 22d, and moved southeast to the northern slope on the 23d and 24th, where it was dissipated on the 25th.

VI.—Increasing pressure and falling temperature in Manitoba, morning of the 18th, indicated the approach of this high area; p. m. barometer at Qu'Appelle, 30.79, about .50 above normal. During the 18th and 19th it rapidly moved southward towards the western Gulf coast, producing high northerly winds in its advance and falling temperature, to more than 20° below the normal. The 20th, it continued nearly

stationary over the western Gulf states; p. m. barometer at Rio Grande City, 30.77, or .63 above normal; 21st, passed eastward over the Gulf states, and 22d, with diminishing central pressure, it moved to the south Atlantic coast, where it disappeared the 23d.

VII.—This high-pressure area was first observed as advancing southward over the Northwest Territory and Manitoba on the evening of the 22d, causing a rapid fall in the temperature in Dakota and Minnesota. During the 23d the central highest pressure moved southward to the lower Missouri valley; p. m. barometer at Fort Garry, 30.89, or .68 above normal. In the upper Mississippi and Missouri valleys the temperature fell from 20° to 30° below the normal, which extended to the Gulf states on the 24th; high northerly winds and gales marked its advance, which on the 23d reached the western and the 24th, the eastern Gulf coast, and the 25th, to southern Florida. It appeared as a barometric ridge reaching from southern Texas to the upper Saint Lawrence valley during the 25th, and temperature about 30° below the normal, with high northerly winds or gales along the Atlantic coast. On the 26th and 27th it slowly moved northeast toward New England and the Saint Lawrence valley; p. m. barometer, 27th, at Montreal, 30.92, or .81 above normal. The 28th and 29th, it gradually disappeared eastward beyond New England.

VIII.—While low area xvi. was off the north Pacific coast on the 28th, this high area advanced southeast over the Northwest Territory, but it was either dissipated or forced to take a northeast course by the former on the 29th.

IX.—During the night of the 29th this area formed over the southern plateau region and moved northwestward on the 30th with increasing pressure, and continued over the plateau regions on the 31st.

AREAS OF LOW BAROMETER.

The following table gives the latitude and longitude in which the centres of the several areas were first and last located, and the average hourly velocity of movement.

Areas of low barometer.	First observed.		Last observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
	° ′	° ′	° ′	° ′	
No. I.	30 45	86 00	43 30	78 00	22.5
II.	38 00	77 00	49 15	65 00	43.7
IV.	46 00	123 30	49 15	71 00	44.8
VI.	49 00	125 30	45 15	80 00	42.8
VII.	27 45	97 30	35 15	77 15	42.2
VIII.	50 15	102 30	45 45	82 00	35.9
IX.	52 30	107 30	48 45	62 30	39.3
X.	32 30	94 45	34 15	76 00	46.5
XI.	53 00	104 00	49 00	59 00	52.5
XII.*	42 30	87 00			59.4
	37 00	101 30	37 30	75 00	67.9
	30 00	92 15			55.4
XIII.	53 00	96 00	50 00	69 30	38.6
XIV†	43 00	86 15			37.1
	27 45	98 30	38 30	75 45	49.2
XVI.	47 00	128 00	39 00	123 00	10.0
XVII.	42 30	94 30	51 00	63 00	35.4

Mean hourly velocity, 42.5 miles. * Centres united in N. 37° 45′, W. 85° 30′. † Centres united in N. 34° 30′, W. 83° 30′.

Eighteen low areas are described below. The paths of the centres of fourteen have been charted; those of numbers iii., v., xv., and xviii. were beyond the limits of the stations. In New England, southeastern parts of New York and Pennsylvania, New Jersey, Delaware, Maryland, and District of Columbia the highest temperatures of the month were recorded on the 9th, during the movement northeastward of low area number iv.; in Montana, Dakota, Wyoming, and northern Colorado on the 12th, during the progress southeast of low area number ix.; in the eastern parts of North Carolina and Virginia on the 24th, during the movement of low area number xiv.; in the Gulf states, northern Florida, Georgia, Kansas, upper Mississippi valley, Ohio valley, northern New York, lower lake region, and upper lake region, excepting along Lake Superior, on the 29th, 30th or 31st, during the progress northeastward of low area number xvii.

Excepting Milwaukee, Grand Haven, Ludington, and Saint Joseph, on Lake Michigan, signals were not displayed at lake stations during the month, on account of navigation having been closed.

I. and II.—During the progress northeast of number i. on the 1st, rainy weather prevailed in the Southern states, with winds veering to brisk and high northerly, but thence northward to New England and the lake region it changed to snow, with brisk to high northeasterly winds, and to the upper Mississippi and Missouri valleys, with northerly winds. By morning of the 2d number ii. had developed, and was central in eastern Virginia. Northeast gales prevailed along the Atlantic coast and in the lake region, with snow and rain in the advance quadrants, and they were followed by northwest gales and much colder, clearing weather on the 2d; midnight barometer at Eastport, 28.98, or 1.07 below normal. Maximum hourly wind-velocities: Fort Elliott, nw., 44; Indianola, n., 54; Galveston, n., 38; Cedar Keys, nw., 35; Key West, n., 36; Fort Macon, w., 47; Delaware Breakwater, w., 36; Sandy Hook, e., 38 and w., 44; Block Island, sw. and nw., 44; Eastport, se., 40; Duluth, w., 36; Milwaukee, ne., 34 and w., 35; Grand Haven, w., 44; Port Huron, w., 36; Toledo, ne., 35 and sw., 39; Cleveland, sw., 38; Buffalo, w., 59; Rochester, w., 43; Mount Washington, se., 70 and nw., 108 miles. Cautionary off-shore signals were ordered, morning of the 1st, for Indianola and Galveston, but they were late; cautionary signals, from Fort Macon to Sandy Hook, and in the afternoon for Lake Michigan (late) and along the New England coast. During the 2d the cautionary signals were changed to off-shore signals along the coast from North Carolina to Maine, and off-shore signals hoisted at Key West. All were fully justified.

III.—After the preceding disturbances had passed to the northeast a barometric trough was left on the 4th, which extended at night over the south Atlantic and Gulf states, and in which this low developed. On the 5th it rapidly moved northeast off the middle Atlantic coast; its track has not been charted; snow fell from South Carolina and northern Georgia to New Jersey. During the 6th it continued its northern course beyond, and to the southeast of, Nova Scotia. Maximum velocities: Fort Macon, n., 48; Kitty Hawk, ne., 60; Cape Henry, n., 46; Chincoteague and Delaware Breakwater, n., 40; Sandy Hook, w., 41; Block Island, n., 32; Mount Washington, nw., 104 miles. On the 4th off-shore signals were ordered for the Gulf, South Carolina and North Carolina coasts, and cautionary signals from Cape Henry to Cape Cod; the 5th, off-shore from Savannah to Jacksonville and at Key West, and cautionary at Cedar Keys. They were generally justified.

IV.—Falling barometer, southeasterly winds increasing to gales on the coast, and threatening weather followed by rain, and changing to snow over the interior, prevailed from northwestern California to Washington Territory from the 1st to the 5th. During the 2d a secondary depression developed between high areas numbers i. and iii., and passed southeast over Idaho, Wyoming, and Colorado, and on the 3d to Texas. The daily charts show that this secondary depression moved east over the Gulf states during the 4th, and assisted in the formation of low area, number iii., on the 5th. Rain became general in the northern half of California on the 5th, with high southerly winds; at Cape Mendocino the barometer fell to 29.55 at noon, and at Fort Canby (Cape Disappointment) to 29.43, or .64 below the mean, during the evening. On the 6th the central depression quickly passed southeast over Utah to western Texas, accompanied by light rains or snow. During the 7th high winds prevailed along the Gulf coast, with rain, changing to snow in Tennessee, Arkansas, Missouri, and the Ohio valley. On the 8th clearing weather followed it in the Gulf states; easterly gales preceded it along the Atlantic coast, with heavy rain, which changed to snow over the interior to the lower lake region. During the 9th easterly gales with snow turning to rain preceded it from New England to the Saint Lawrence valley and the Canadian maritime provinces, while high northwesterly winds or gales and much colder, clearing weather succeeded it throughout the Atlantic

states; lowest barometer, 28.96 at Montreal, and 1.08 below the normal at Philadelphia. Maximum velocities: Fort Canby, se., 72; Cape Mendocino, se., 100; San Francisco, se., 28; Indianola, n., 49; Smithville, se., 49; Kitty Hawk, se., 60; Delaware Breakwater, se., 44; Sandy Hook, e., 58; Block Island, se., 44; Provincetown, se., 53; Boston, se., 48; Portland, e., 56; Eastport, se., 46; Toledo, n., 32; Buffalo, sw., 41; Rochester, w., 44; Mount Washington, se., 112 and nw., 130 miles. Cautionary signals were ordered on the 6th for the Texas coast; the 7th, for the remainder of the Gulf, the south Atlantic and middle Atlantic coasts; the 8th, for the New England coast. All were in good time and well justified. Warnings were also sent on the 8th for Canadian stations in Nova Scotia, and 9th, for those in the Saint Lawrence valley and along the Gulf of Saint Lawrence.

V.—During the 6th, after low area number iv. had passed southeastward, the pressure again diminished along the north Pacific coast, with southeasterly winds increasing to gales, and rainy weather. On the 7th and 8th it apparently moved northeast over the Northwest Territory. Maximum velocities: Cape Mendocino, se., 68; Fort Canby, s., 64; Fort Benton, sw., 36; Medicine Hat, s., 45; Fort Garry, s., 35 miles.

VI and VII.—Before the barometer had reached the normal, succeeding low area number v., on the north Pacific coast, it again fell on the 8th, with continued rainy weather and high southerly winds; noon, barometer at Olympia .46 below normal. The central depression rapidly moved eastward and by morning of the 9th had reached the northern boundary of Dakota; during that day and the 10th high westerly winds and snow prevailed in its western quadrants. Number vii. formed over Texas on the 10th in the barometric trough which was produced in that direction by number vi. Between these two and high area number iv., from the Missouri valley to Texas, the gradient became quite steep, resulting in high northerly winds. On the 11th rainy weather prevailed in the Gulf and South Atlantic states, and rain turning to snow from Tennessee northeast to New England. Maximum velocities: Fort Canby, s., 48; Fort Maginnis, nw., 48; Fort Buford, nw., 42; Fort Bennett, nw., 40; Dodge City, n., 36; Fort Elliott, n., 45; Fort Concho, n., 40; Brownsville, s., 41; Indianola, n., 48; Kitty Hawk, ne., 32; Delaware Breakwater, w., 42 miles. Cautionary signals were ordered for Lake Michigan on the 9th; 10th, off-shore signals at Indianola and Galveston, and cautionary at New Orleans, Mobile and Pensacola; 11th, on the North Carolina coast. They were generally justified.

VIII.—This disturbance advanced southeast from the Northwest Territory on the 10th. During the 11th light snows accompanied it in the extreme northwest, upper Mississippi valley, and upper lake region, and southwest veering to northwest gales in its western quadrants; on the 12th light snows and brisk winds in the lake region and upper Ohio valley. Maximum velocities: Medicine Hat, sw., 50; Forts Shaw and Assinaboine, sw., 44; Fort Maginnis, sw., 52; Fort Buford, w., 37; Cheyenne, nw., 42 miles. Signals were continued for this storm on Lake Michigan, but not justified as to velocity.

IX.—Like the preceding, this storm moved southeast over the Northwest Territory and Manitoba on the 12th, with snow in latter and with southerly veering to northerly gales in former and Montana. During the 13th light snow or rain and brisk to high southerly winds veering to westerly accompanied it from the upper Mississippi valley eastward of the lake region to New England and the Saint Lawrence valley, followed by clearing weather on the 14th. Maximum velocities: Medicine Hat, sw., 55; Forts Shaw and Assinaboine, sw., 48; Fort Maginnis, ne., 48; Fort Buford, nw., 37; Saint Vincent, n., 32; Milwaukee and Grand Haven, s., 29; Buffalo, w., 46; Delaware Breakwater, sw., 52; Block Island, sw., 32; Mount Washington, sw., 76 miles. Cautionary signals were ordered for Lake Michigan on the 12th; 13th, for the New England coast, and off-shore along the middle Atlantic coast. All were justified.

X.—As number ix. progressed eastward a barometric trough was formed to the southwest, in which, by morning of the 14th, this slight disturbance developed. Rain accompanied it in the Gulf states and Tennessee, and snow in the Ohio valley during that date; light rains at night extended to the south Atlantic states, and mostly as snow in the middle Atlantic states. Maximum velocities: Fort Macon, nw., 32; Kitty Hawk, ne., 38; Delaware Breakwater, ne., 36; Sandy Hook, ne., 38 miles. Cautionary signals were ordered on the 14th, for Lake Michigan, and along the coast from North Carolina to Massachusetts. Those along Lake Michigan and the southern New England coast were not justified.

XI.—There were indications of the approach of a disturbance from the Northwest Territory on the 15th. As it advanced southeast during the 16th and 17th, high southwesterly winds, were occasionally reported in its southwestern quadrant. Maximum velocities: Forts Assinaboine, Shaw, and Maginnis, sw., 36; Mackinac City, sw., 36; Rochester, sw., 43 miles. Cautionary signals were displayed on Lake Michigan on the 17th, and justified; also on the New England coast, and partly justified.

XII.—This low area resulted from a combination of three minor depressions. On the evening of the 14th a disturbance existed south of California. During its progress eastward light rains or snow accompanied it on the 15th, 16th, and 17th from southern California to the Gulf states. During the 17th a barometric trough formed to the southwest from low area number xi. In that trough two distinct depressions developed on the 18th, and the three united as shown on the chart; threatening weather, with rain, prevailed in the Southern, and southern part of the middle, Atlantic states, changing to snow from the Missouri valley eastward over the lake region. At night the advance of high area number vi. produced a steep gradient from the Missouri valley to the Texas coast, and high northerly winds. During the 19th light rains continued in the southern part of the middle Atlantic states, changing to snow thence over New England, the lower lake region, Ohio valley, and Tennessee, and clearing weather in the south Atlantic and Gulf states. On the 20th, clearing weather succeeded light snows from the New England and middle Atlantic coasts to the lower lakes, Ohio valley and Tennessee. Maximum velocities: Indianola, ne., 35; Pike's Peak, nw., 52; Fort Elliott, n., 40; Duluth, ne., 32; Milwaukee, n., 34; Fort Macon, s., 31; Sandy Hook, ne., 32; Block Island, n., 40; Eastport, ne., 32 miles. Cautionary signals were ordered on the 18th on Lake Michigan, and from North Carolina to New Jersey, and off-shore for the Texas coast; 19th, cautionary signals for the New England coast. They were justified, but lowered too early on the middle Atlantic and North Carolina coasts. Warnings were also sent for the Canadian stations in Nova Scotia on the 19th.

XIII and XIV.—On the 20th the observations from Manitoba and the Northwest Territory indicated the presence of a disturbance to the northward. Generally fair weather prevailed in the lake region on the 21st, with brisk to high southerly veering to westerly winds; also on the 22d in the middle Atlantic and New England states. During the latter date an extensive barometric trough formed, which reached from the upper lakes to New Mexico, and in which two distinct depressions, number xiv., developed at night, one over Lake Michigan and the other in southern Texas, with light snows from the upper lakes to the upper Missouri valley. On the 23d rainy weather prevailed in the Gulf states, changing to snow thence to the lakes. To the westward of these depressions high area number vii. was moving southward over the Missouri valley, causing a steep gradient between them, and high northerly winds. During the 24th the two depressions united and quickly moved northeast over the middle Atlantic coast. Clearing, and much colder, weather followed in the Gulf states, Tennessee, Ohio valley and lake region; the rain-area covered the Atlantic coast districts, with high winds from North Carolina northeastward, but followed by much colder, clearing weather afternoon or night of the 25th. Maximum velocities: Fort Maginnis, nw., 34; Grand Haven, sw., 36; Buffalo, sw., 34; Eastport, s., 32;

Omaha, Dodge City and Fort Elliott, n., 32; Fort Concho, s. and n., 32; Brownsville, s., 39; Indianola, n., 42; Smithville, s., 36; Kitty Hawk, se., 38: Delaware Breakwater, nw., 36; Block Island, s., 32 miles. Cautionary signals were ordered on the 21st for Lake Michigan; 21st and 22d, along the coast from North Carolina to Maine; 22d, for Texas coast; 23d, for the middle Atlantic, south Atlantic, and remainder of Gulf coast; 24th, for New England coast. They were generally justified. Warnings were sent for the stations in Nova Scotia on the 24th.

XV.—The track of the centre of this disturbance has not been charted. It passed eastward over the Northwest Territory and Manitoba on the 23d and 24th, and was probably forced to take a more northerly course by high area number vii., then over the lower Missouri valley. High velocities: Qu'Appelle, sw. and nw., 30; Fort Maginnis, w., 47; Fort Buford, w., 36; Fort Garry and Saint Vincent, s., 38 miles.

XVI.—This storm probably moved southward off the Pacific coast, as shown on the chart, accompanied by severe southerly gales in the Pacific coast districts, with heavy rains. Lowest barometer, 29.27, at Cape Mendocino, or .79 below the normal on the 26th. It sent out to the eastward several secondary depressions across the plateau regions which on the 27th and 28th caused cloudy weather east of the Rocky mountains, with light rains in the southern and central districts, and light snows in the northern districts. Maximum velocities: Fort Canby, e., 46; Cape Mendocino, se., 100; Red Bluff, s., 36; Sacramento, s., 30; San Pedro, se., strong gale; San Diego, s., 31 miles. Signals were ordered for Lake Michigan on the 27th; on the coast from Maine to Delaware on the 28th, but were only partly justified.

XVII.—Although its track cannot be definitely traced, the tri-daily weather charts show that this disturbance developed from low area number xvi., and crossed the plateau regions on the 28th. During the 29th, as it moved toward Lake Superior, light snow fell in its northern, and light rains in its southern, quadrants. On the 30th light rains prevailed from Tennessee and the middle Atlantic and New England coasts to the lakes, but partly as snow in the upper lake region and upper Mississippi valley, with brisk to high southerly veering to westerly winds. Maximum velocities: Salt Lake City, se., 32; Pike's Peak, sw., 73; Prescott, s., 30; Fort Concho, s., 36; Cheyenne, nw., 34; Milwaukee, w. 38; Port Huron, nw., 35; Rochester, w., 44; Delaware Breakwater, w., 40; Eastport, s., 29; Mount Washington, sw., 116 and nw., 88 miles. Cautionary signals were ordered up on Lake Michigan on the 29th; along the coast from Virginia to Maine, 30th; North Carolina coast, 31st. Excepting some of the New England stations, they were justified.

XVIII.—During the 31st this storm was advancing southeast over the Northwest Territory, causing westerly gales in Montana; at midnight it was central some distance north of the limit of the stations. Maximum velocities: Medicine Hat, s., 60; Fort Assinaboine, sw., 40; Fort Shaw, sw., 48; Fort Maginnis, nw., 48 miles.

NORTH ATLANTIC STORMS DURING JANUARY, 1884.

[Pressure expressed in inches and in millimetres; wind-force by scale of 0—10.]

Chart ii. exhibits the tracks of the more important atmospheric depressions that have appeared over the north Atlantic ocean during January, 1884. The location of the various storm-centres has been approximately determined from reports of observations furnished by agents and captains of ocean steamships and sailing vessels, and from other miscellaneous data received at this office up to February 21, 1884.

The observations are, in general, simultaneous, being taken each day at 7 h. 0 m. a. m., Washington, or 0 h. 8 m. p. m., Greenwich, mean time.

Of the twelve depressions charted, five were apparently continuations of disturbances which passed over the United States and the Canadian maritime provinces; two were first observed near the sixtieth meridian, and the remaining five appear to have originated to the eastward of 40° west longitude. Of the latter, that charted as number x. was remarkable on account of the great damage it caused in the British Isles and northwestern Europe, and for the extraordinary depth of the atmospheric depression, the barometer near the centre of disturbance having fallen to 27.65 (702.2). With the exception of number x., none of the disturbances appear to have exhibited any great storm-energy; the month was, however, characterized by a succession of strong westerly breezes to fresh gales, with frequent fogs to the westward of the forty-fifth meridian, during the closing days of the month.

The following are brief descriptions of the depressions charted:

I.—This was probably a continuation of the disturbance charted as x. on the chart for December, 1883. At the close of that month it was central near N. 50°, W. 40°, the atmospheric pressure ranging from 29.65 (753.1) to 29.8 (756.9). By January 1st the region of least pressure was about N. 46°, W. 35°, the barometer having fallen to 29.17 (740.9). The area of the disturbance was apparently extensive, since vessels as far south as N. 36°, W. 39° had fresh northwesterly gales of force 7 to 8, with barometer about 29.55 (750.6), and those on the twenty-eighth and thirtieth parallels had fresh to strong westerly and southwesterly breezes, and pressure ranging from 29.75 (755.6) to 29.85 (758.2). Between N. 48° and 52° moderate to fresh easterly to southerly winds prevailed, with pressure ranging from 29.28 (743.7) to 29.85 (758.2). The disturbance moved slowly northeastward, and on the 2d it was central near N. 47°, W. 29°, the pressure remaining about 29.15 (740.4); the winds remained moderate in force over the region near, and to the eastward of, the centre, but to the westward of the centre they attained the force of a moderate to fresh gale. On the 3d the reports showed the centre of disturbance to be near N. 49°, W. 27°, the pressure having fallen to 28.86 (733.0). The s. s. "Olinde Rodrigues," P. Cahour, commanding, reported, in N. 47° 42′, W. 27° 06′, barometer, 28.86 (733.0), wind sw., force, 6, high nnw. sea, and cloudy weather. The s. s. "Assyrian Monarch," J. Harrison, commanding, in N. 47° 56′, W. 30° 30′, reported barometer 29.16 (740.7), wind nne., force 7, heavy ne. swell, cloudy. Moderate to strong northerly and northwesterly gales, with pressure ranging from 29.16 (740.7) to 29.51 (749.5), prevailed over the region between W. 30° and 40°, while fresh to strong breezes only were reported in front of the centre of disturbance. On the 4th the storm-centre was near N. 51°, W. 22°, where the pressure was about 29.5 (749.3), with moderate easterly breezes to the northward of the fifty-first parallel. During the day the disturbance moved apparently in a north-northeasterly direction, and on the 5th it was central north of the fifty-fifth parallel and near W. 13°. On that date the s. s. "Circassian," Lieut. W. H. Smith, R. N. R., commanding, reported, in N. 55° 40′, W. 13° 10′, barometer 29.21 (741.9), wind w., force 3, overcast and showery. By the morning of the 6th the disturbance was central to the northeastward of Scotland.

II.—This was probably a continuation of the disturbance described as low area number iii., but not charted on chart i. of this REVIEW. At midnight of the 5th the centre was off the New England coast, and by the morning of the 6th the marine reports indicated its presence in about N. 42°, W. 60°. The s. s. "Neckar," R. Bussius, commanding, reported in N. 40° 43′, W. 59° 32′, barometer 29.31 (744.5), wind nw. to ssw., force 5 to 8, high cross sea from sw. Moderate northerly gales prevailed between W. 65° and 70°, and near the fortieth parallel, and strong westerly and northwesterly gales were reported by vessels near N. 35° and between W. 65° and 72°, while moderate southerly and southeasterly winds occurred to the eastward of W. 62°. At the same time another depression appears to have been passing northeastward over Newfoundland, as vessels to the northward of N. 45°, and between W. 48° and 54°, reported fresh to strong southwest to northwest gales, with rain and snow-squalls, and the schooner "Excel," fifty miles west of Saint Pierre, Newfoundland, lost

boats, etc., in a heavy nw. gale. The depression moved rapidly northeastward, and on the 7th it was near N. 50°, W. 38°; the s. s. "Nova Scotian," W. Richardson, commanding, reported in N. 51° 16′, W. 36° 52′, barometer, 29.38 (746.2), wind w. by s., force 7, heavy rain. Strong southerly and southwesterly gales were reported between N. 45° and 55°, and W. 38° and 28°; vessels to the westward of the fortieth meridian and south of N. 45°, had moderate to strong westerly and northwesterly gales. On the 8th the disturbance was shown near N. 55°, W. 27°, where the lowest reported pressure was 29.5 (749.3). East of 25° west longitude, the winds shifted from west to southwest and south, and blew with the force of a fresh gale, and strong westerly and northwesterly winds now prevailed over the ocean between W. 25° and 55°. Moving northeastward during the day, the disturbance appeared off the northwestern coast of Scotland on the 9th, and passed beyond the limits of the observations as yet to hand.

III.—This was a continuation of low area iv. of chart i. During its passage northeastward along the coast on the 8th and 9th, it caused very heavy southeast to southwest gales from the coast of the United States eastward to the seventieth meridian, and between N. 30° and 40°; north of the fortieth parallel, strong northeasterly winds prevailed. Several vessels were driven ashore, while others lost sails, spars, etc. The following reports indicate the severity of the gale. 7th, brig "Osseo," in N. 30°, W. 74°, had a hurricane from se., lasting forty-eight hours, carried away rudder head; 8th, bark "Belle Wooster," between Hatteras and Lookout, had a heavy se. gale with high cross sea, in which she lost and split sails; the schooner "Eleanor," off Hatteras, lost deck-load, had cabin-house stove and filled, sails split, and received other damage. On the same date the schooners "Emma C. Rommel" and "John N. Parker" drove ashore near Hatteras during the furious se. gale; the schooner "Maggie M. Rives" was abandoned in N. 34°, W. 76° 07′, having been dismasted and become water-logged during this gale. The steamer "Flamborough," from the West Indies for New York, also encountered heavy weather on the 8th and 9th; the s. s. "Tangier," in N. 36°, W. 71°, lost port lifeboat, stove main-rail, and did other damage during a heavy s. gale on the 9th. Captain Clarke, commanding the the s. s. "Olbers," reported on the 8th, "6 p. m., fresh se. gale, threatening weather, wind increasing and gradually veering to s., with falling barometer, high sea making up; 11 p. m., high confused sea from se. and e., with light rain; 9th, N. 33° 50′, W. 69° 55′, heavy s. gale, barometer 29.74 (755.4), dark and squally, with rain, wind veering to sw.; 4 p. m., heavy squalls, wind veering to w., with very high confused sea running; squally, with rain and hail during the night, and moderating towards 8 a. m. of the 10th." Captain Ogier, of the schooner "Viola Reppard," in about N. 41°, W. 71°, reported: "8th, 2 p. m., fresh ese. gale; 4 p. m., gale increasing, hove ship to, high se. sea; 9th, wind same, with rain, hail and snow; 10 a. m. moderating; 2 p. m., wind hauling to sw. and wnw., blowing, if possible, harder than ever, rain, hail and snow, with fearfully high cross sea." Captain Sawyer, of the bark "Ibis," in about N. 38° 43′, W. 71° 40′, reported, "the gale of the 9th and 10th, was very severe for thirteen hours, and a very heavy sea rolled up from se., and afterwards from sw. While the gale continued from se. it was attended by rain, but after hauling to sw. it cleared off. This gale revolved from ne. (where it began) to se., thence to wsw., (where it finished). The barometer fell very quickly on the approach of the gale and at midnight of the 9th, it read 29.16 (740.7)." The schooner "Anna A. Holton," G. Smith, commanding, took the gale in about N. 35° W. 74° on the 8th, and stove bulwarks, stanchions, and sustained other damage. Captain Powell, of the bark "Aquidneck," reported that when the gale began, about 1 h. 30 m., Greenwich time, of the 8th, the barometer read 30.45 (773.4), but falling rapidly, and wind freshening from se.; the ship was hove to in about N. 34° 54′, W. 74° 03′, and the wind and sea continued to increase in violence, the barometer reaching its lowest point, 29.4 (746.7), at 17 h. of the 8th. Captain Powell reported that he never saw such a fearfully high sea, and estimated the velocity of the wind to be about eighty miles an hour; the spray went over the fore and main yards. By the morning of the 10th the disturbance had reached the Gulf of Saint Lawrence, followed by westerly and northwesterly gales in its rear. On the 11th and 12th the depression moved northeastward with decreasing energy, and apparently filled up on the last-mentioned date.

IV.—This was probably a continuation of low area vii. of chart i. It passed off the North Carolina coast into the Atlantic on the 11th, and moving northeastward during the 12th, it appeared south of Newfoundland on the following day, when the lowest reported pressure, 29.42 (747.3), was observed in N. 46° 9′, W. 53° 26′, on board the s. s. "Circassian." On the 14th, the depression was near N. 48°, W. 45°, where the barometer read 29.75 (755.6). Northerly and westerly winds of moderate force prevailed over the region west of W. 48°, and moderate southerly winds were reported to the eastward of W. 40°. On the 15th the region of least pressure was in N. 51°, W. 40°; the lowest reported barometric reading was 29.39 (746.5), wind sw., force 8, observed in N. 49° 34′, W. 42° 54′ by Captain C. Wiegand, commanding the s. s. "Salier". The southerly winds increased somewhat in force over the region east of the centre of depression, but the winds in its rear remained moderate. On the 16th the disturbance moved slowly eastward, and by the 17th the region of low-pressures extended from W. 45° eastward to W. 28°, and moderate to strong southerly to westerly gales prevailed over that region. At the same time the area of barometric maxima, which had apparently checked the eastward movement of the depression, began to give way, and by the 18th the disturbance was shown in about N. 51°, W. 23°, near which region it remained, with gradually increasing pressure, until the 20th, when it filled up.

V.—This was a continuation of low area ix. of chart i. It passed over the Gulf of Saint Lawrence on the 14th, and, moving eastward, apparently combined with low area iv. above described.

VI.—The reports of the 19th indicated the existence of a depression north of N. 50°, and between W. 37° and 42°. The s. s. "Llandaff City," T. L. Weiss, commanding, reported in N. 48° 32′, W. 37° 2′, barometer 29.8 (756.9), wind s., force 7, stormy weather and rain. The disturbance moved northeastward, and on the 20th it was central north of the fifty-fifth parallel and east of W. 32°, afterwards passing beyond the range of observations. Captain Laub, commanding the s. s. "Thingvalla," reports in connection with the gale, as follows: "On the 19th, at 5 h., Greenwich time, nearly calm, wind backing to sse., barometer falling, long and increasing westerly swell; 6 h., wind-force 4, rainy weather; 8 h., wind-force 8, barometer 29.61 (752.1). At 9 h. 30 m., wind chopped to sw. in a squall, force 9, barometer 29.58 (750.0); 10 h. 15 m., barometer 29.58 (751.3), then stationary, but wind and westerly sea rapidly increasing. At 2 a. m., of the 20th, (Greenwich mean time), wind sw., force 10, sea so high that I only once or twice remember the like; barometer slowly falling till 5 a. m., 29.54 (750.3). At 7 h. 30 m., the wind began to haul to the westward, its force keeping up until 8h. 30 m." (Ship's position, between N. 55° 50′, W. 30 16′, and N. 55° 5′, W. 32° 10′).

VII.—This was a continuation of low area xii. of chart i. It passed into the Atlantic from Virginia on the 19th, causing strong se. to nw. gales between N. 35° and 40°, and on the 20th it was central near the southern part of the Banks of Newfoundland. The barometric pressure was 29.5 (749.3), and strong southerly gales were reported to the eastward as far as W. 40°, with equally strong northerly and westerly gales to the westward of W. 50°. During the day the disturbance appears to have moved quickly northeastward and on the 21st it was shown near N. 52°, W. 30°; on the following day it moved slowly eastward and by the 23d it was off the Irish coast, attended by strong westerly gales near the fiftieth parallel. During the day the disturbance appears to have passed eastward over the British Isles towards the North sea.

VIII.—This was a slight depression which developed near the Banks of Newfoundland on the 21st; it moved northeastward without exhibiting much storm-energy, and finally dissipated on the 22d.

IX.—This was probably a continuation of low area xiv. of chart i. On the 24th the disturbance was central to the southeastward of Nova Scotia; it appears to have remained nearly stationary, as on the 25th it was near N. 45°, W. 57°; it was, however, apparently filling up, and on the 26th it was replaced by an area of high-pressure.

X.—This was the most severe storm of the month, and, so far as can be determined from the data as yet to hand, appears to have originated east of the thirtieth meridian. An area of high-pressures occupied the ocean between W. 20° and Newfoundland, and south of 50° north latitude, during the 23d and 24th; on the 25th this began to give way, and the pressure decreased to 29.7 (754.4) and 29.5 (749.3) over the region between W. 30° and the British Isles. The pressure continued to decrease rapidly, and by the 26th all vessels between W. 30° and W. 10°, and N. 48° and 53°, reported barometric readings ranging from 28.43 (722.1) to 29.01 (736.8), with furious westerly gales and very high sea. A report of this gale published in the "Northern Whig" (Belfast newspaper), states that the barometer at 5.30 p. m. of the 26th fell to 27.65 (702.3), which is probably unprecedented. Immense damage was done to shipping on the coasts and to property in the north of Ireland; all telegraph lines were prostrated and many persons were injured. The storm raged throughout the British Isles and western Europe during the 27th, and until the 28th.

XI.—The circulation of the winds between W. 30° and 40° and N. 45° and 50°, on the 28th, showed the development of a depression in that region. By the 29th the pressure ranged from 29.24 (742.7) to 29.4 (746.7) between N. 47°, W. 38, and N. 52°, W. 28°, while strong ssw. and sw. gales prevailed. The disturbance moved northeastward beyond the fifty-fifth parallel on the 30th, the pressure on that day being about 29.3 (744.2), wind wsw., force 8, in N. 55°, W. 11°.

XII.—This disturbance appeared near N. 48°, W. 27° to W. 21°, on the 30th, when the pressure ranged from 29.51 (749.5) to 29.6 (751.8), and at the close of the month it was central southwest of Ireland, attended by strong northerly and northwesterly gales to the westward.

OCEAN ICE.

Chart ii. also exhibits the southern and eastern limits of icebergs in the north Atlantic ocean during the month of January, and up to February 14, 1884. This chart is based on reports communicated by shipmasters to this office; reports furnished through the co-operation of the "New York Herald Weather Service," and other data published by the "New York Maritime Register."

During the period embraced in the reports (January 20th to February 14th), icebergs drifted southward to about N. 42° 50′, while the eastern limit was on the forty-fifth meridian. The most dangerous region appears to have been from about N. 45° northward to N. 48°, and between W. 46° and 49°.

A comparison with the chart for the same period in 1883 shows that the southern limit is about 1° 40′ south of that for last year, while the eastern limit is about the same for both years. In point of numbers the icebergs appear to be somewhat more numerous than those observed up to February 14, 1883; those reported were seen about ten days earlier than last year.

Icebergs and field-ice have been reported as follows:

January 24th.—S. S. "British Prince," in N. 48° 02′, W. 47° 43′, passed field-ice.

January 26th.—S. S. "Plover," at Saint John's, Newfoundland, reports heavy Arctic ice northeast of Notre Dame Bay; icebergs of vast size being scattered through the field-ice.

January 28th.—S. S. "Somerset," in N. 47° 25′, W. 46° 44′, passed a quantity of field-ice.

January 31st.—S. S. "City of Montreal," in N. 46° 25′, W. 46° 54′, passed great quantities of field-ice; steered sw. for four hours to clear it; s. s. "Britannic," in N. 46° 47′, W. 46° 46′, passed through several patches of field-ice.

February 1st.—S. S. "Holland," in N. 45° 44′, W. —° —′? passed a quantity of field-ice fifty miles long, bearing sw. and ne., with several small bergs on the se. side.

2d.—S. S. "Notting Hill" collided with an iceberg and was so seriously damaged that she was abandoned on the 5th in N. 46°, W. 46° 20′; s. s. "England," in N. 45° 28′, W. 47° 49′, passed through a large quantity of field-ice.

3d.—S. S. "Rhaetia," from N. 44° 57′, to N. 44° 53′, and W. 49° 38′ to W. 49° 50′, passed large fields of ice and many pieces; s. s. "Westernland," in N. 45° 26′, W. 47° 54′, passed through large quantities of field-ice; s. s. "Caspian," in N. 47° 10′, W. 48° 00′, passed south of some field-ice.

4th.—S. S. "Salerno," in N. 44° 23′, W. 48° 38′, passed some field-ice; s. s. "Kansas," in N. 46° 14′, W. 47° 00′, passed four icebergs.

5th.—S. S. "State of Nebraska," in N. 46° 15′, W. 46° 20′, fell in with some detached ice.

6th.—S. S. "Moravia," in N. 44° 30′, W. 48° 45′, passed an iceberg; s. s. "Republic," in N. 45° 28′, W. 48° 20′, passed a quantity of small ice; s. s. "Lord Clive," in N. 43° 50′, W. 49° 15′, saw an ice-floe apparently about fifty or sixty feet long and ten to fifteen feet high.

7th.—S. S. "Habsburg," in N. 44° 45′, W. 49° 0′, sighted two small icebergs; s. s. "Leerdam," in N. 46° 56′, W. 47° 24′, passed some icebergs.

8th.—S. S. "Lydian Monarch," in N. 46° 44′, W. 45° 50′ passed an iceberg.

9th.—S. S. "Rugia," in N. 44° 04′, W. 47° 18′, to N. 44° 34′, W. 48° 50′, passed three icebergs; s. s. "Chateau Lafitte," in N. 42° 50′, W. 49° 00′, passed an iceberg; s. s. "Canada," in N. 45° 20′, W. 49° 24′, passed an iceberg; s. s. "Ludgate Hill," in N. 45° 38′, W. 47° 25′, passed a large iceberg.

10th.—S. S. "Nevada," in N. 46° 22′, W. 47° 33′, passed several large flat bergs and much field-ice.

13th.—S. S. "Switzerland," in N. 45° 45′, W. 45° 29′, passed within a mile of a large iceberg about five hundred feet long and one hundred feet high.

14th.—S. S. "Switzerland," in N. 44° 34′, W. 49° 28′, passed through a quantity of light field-ice.

TEMPERATURE OF THE AIR.

[*Expressed in degrees, Fahrenheit.*]

In the following table are shown the normal temperatures for January, the mean temperatures for January, 1884, and the departures from the normal in the several geographical districts, as deduced from the records of the Signal Service:

Average temperatures for January, 1884.

Districts.	Average for January. Signal-Service observations.		Comparison of Jan., 1884, with the average for several years.
	For several years.	For 1884.	
	°	°	°
New England	26.6	24.3	2.3 below.
Middle Atlantic states	33.8	30.7	3.1 below.
South Atlantic states	47.2	42.9	4.3 below.
Florida peninsula	60.5	57.2	3.3 below.
Eastern Gulf states	49.4	41.2	8.2 below.
Western Gulf states	47.9	40.9	7.0 below.
Rio Grande valley	57.9	52.6	5.3 below.
Tennessee	40.0	31.8	8.2 below.
Ohio valley	33.0	24.8	8.2 below.
Lower lake region	25.1	18.7	6.4 below.
Upper lake region	19.6	13.0	6.6 below.
Extreme northwest	5.1	0.9	4.2 below.
Upper Mississippi valley	23.9	17.9	6.0 below.
Missouri valley	19.1	16.0	3.1 below.
Northern slope	18.0	18.9	0.9 above.
Middle slope	28.5	29.3	0.8 above.
Southern slope	45.0	39.0	6.0 below.
Southern plateau	42.7	43.3	0.6 above.
Northern plateau	31.2	31.2	Normal.
North Pacific coast region	39.6	38.9	0.7 below.
Middle Pacific coast region	47.1	47.6	0.5 above.
South Pacific coast region	52.9	54.5	1.6 above.
Mount Washington, N. H	5.4	5.2	0.2 below.
Pike's Peak, Colo	2.8	2.4	0.4 below.
Salt Lake City, Utah	28.3	29.1	0.8 above.